U.S. DEPARTMENT OF COMMERCE
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PB-288 009

Lake Elsinore, Riverside County, California

(U.S.) National Eutrophication Survey, Corvallis, OR

Prepared for

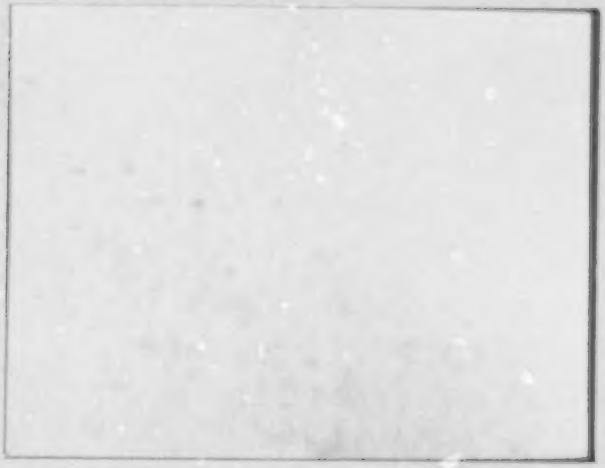
Corvallis Environmental Research Lab, OR

Jun 78

PB 288009

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL EUTROPHICATION SURVEY

WORKING PAPER SERIES



CORVALLIS ENVIRONMENTAL RESEARCH LABORATORY - CORVALLIS, OREGON

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TECHNICAL REPORT DATA
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1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO. PB288009
4. TITLE AND SUBTITLE Report on Lake Elsinore, Riverside County, California		5. REPORT DATE Prepared June 1978 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) Anonymous (National Eutrophication Survey Staff)		8. PERFORMING ORGANIZATION REPORT NO. Working Paper # 745
9. PERFORMING ORGANIZATION NAME AND ADDRESS National Eutrophication Survey U.S. Environmental Protection Agency 200 S. W. 35th St. Corvallis, Oregon 97330		10. PROGRAM ELEMENT NO. 11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS Office of Research and Development U.S. Environmental Protection Agency 401 M Street, S. W. Washington, DC 20460		13. TYPE OF REPORT AND PERIOD COVERED Final - March '75 - Nov. '75 14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES
Prepared in cooperation with the U.S. Environmental Protection Agency, National Environmental Research Center, Las Vegas, Nevada 89114

16. ABSTRACT

Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivided according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
eutrophication lakes nutrients phosphorus nitrogen loading		48G

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS (This Report)	21. NO. OF PAGES
Release unlimited		29
	20. SECURITY CLASS (This page)	22. PRICE MF A01 PC A03

Form 2220-1 (9-73)

REPORT
ON
LAKE ELSINORE
RIVERSIDE COUNTY
CALIFORNIA

EPA REGION IX

WORKING PAPER NO. 745

WITH THE COOPERATION OF THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

AND THE

CALIFORNIA NATIONAL GUARD

JUNE, 1978

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FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to freshwater lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentration (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's fresh water lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGEMENT

The staff of the National Eutrophication Survey (Office of Research & Development, U.S. Environmental Protection Agency) expresses sincere appreciation to the California State Water Resources Control Board and the nine Regional Water Quality Control Boards for professional involvement, to the California National Guard for conducting the tributary sampling phase of the Survey, and to those California wastewater treatment plant operators who voluntarily provided effluent samples and flow data.

The staff of the Division of Planning and Research of the State Water Resources Control Board provided invaluable lake documentation and counsel during the Survey, coordinated the reviews of the preliminary reports, and provided critiques most useful in the preparation of this Working Paper series.

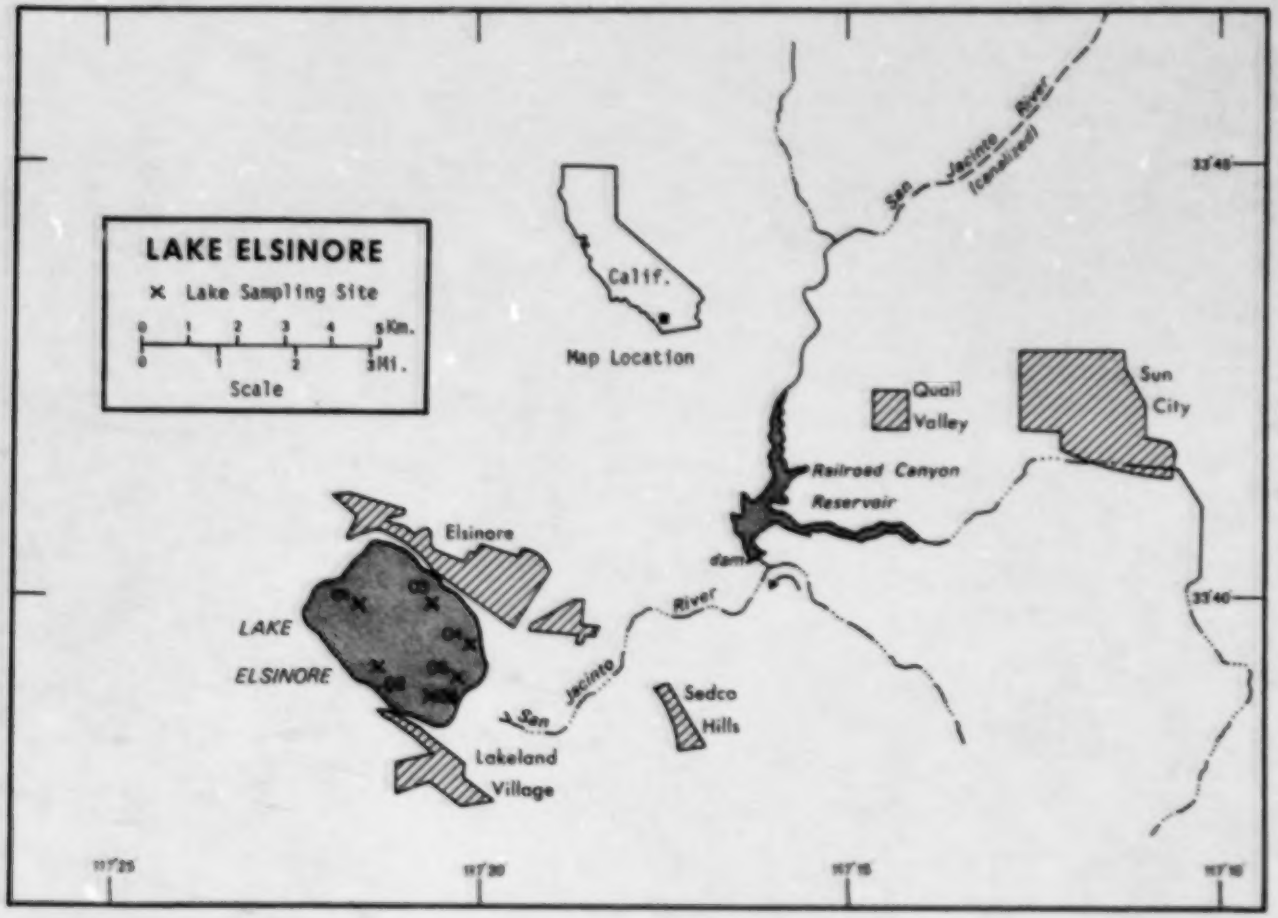
Major General Glen C. Ames, the Adjutant General of California, and Project Officer Second Lieutenant Terry L. Barrie, who directed the volunteer efforts of the California National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

STUDY RESERVOIRS

State of California

Name	County
Amador	Amador
Boca	Nevada
Britton	Shasta
Casitas	Ventura
Crowley	Mono
Don Pedro	Tuolumne
Elsinore	Riverside
Fallen Leaf	El Dorado
Hennessey	Napa
Henshaw	San Diego
Iron Gate	Siskiyou
Lopez	San Luis Obispo
Mary	Mono
Mendocino	Mendocino
Nicasio	Marin
Lower Otay	San Diego
Pillsbury	Lake
Santa Margarita	San Luis Obispo
Shasta	Shasta
Shaver	Fresno
Silver	Mono
Tahoe	El Dorado, Placer, CA; Carson City, Douglas, Washoe, NV
Tulloch	Calaveras, Tuolumne
Lower Twin	Mono
Upper Twin	Mono


LAKE ELSINORE
× Lake Sampling Site
0 1 2 3 4 5 Km.
0 1 2 3 Mi.
Scale
Calif.
Map Location
San Jacinto River (canalized)
33°45'
Quail Valley
Sun City
Railroad Canyon Reservoir
dam
Elsinore
LAKE ELSINORE
River
San Jacinto
33°40'
Sedco Hills
Lakeland Village
117°25'
117°20'
117°15'
117°10'

LAKE ELSINORE

STORET NO. 0607

I. INTRODUCTION

Except for periods of extreme runoff in the San Jacinto River, Lake Elsinore receives water only from three deep wells discharging within the lake, from direct precipitation, and from the immediate drainage (Anonymous, 1975). Therefore, this report primarily pertains to the lake sampling data.

It should be noted that because of the proximity of Survey sampling stations 4, 5, and 6 to the three wells, those stations are not representative lake stations but are mixtures of well water and lake water in varying proportions, depending on the operation of the well pumps at the times the samples were collected (Bailey, 1977).

II. CONCLUSIONS

A. Trophic Condition*:

Survey data indicate that Lake Elsinore is hypereutrophic. It ranked twenty-third in overall trophic quality when the 24 California lakes and reservoirs sampled in 1975 were compared using a combination of six parameters**. All of the other waterbodies had less median total phosphorus, 21 had less median dissolved orthophosphorus, 19 had less median inorganic nitrogen, and all of the others had less mean chlorophyll *a* and greater mean Secchi disc transparency.

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* Trophic assessment is based on levels of nutrients, dissolved oxygen, and chlorophyll *a*; phytoplankton kinds and numbers; and transparency (Allum et al., 1977).

** See Appendix A

Survey limnologists observed algal blooms in progress all three sampling times, and depression of dissolved oxygen and fish kills occur routinely during summer months (Bailey, op. cit.).

B. Rate-Limiting Nutrient:

The results of the algal assay indicate Lake Elsinore was nitrogen limited in March and November. The lake data indicate nitrogen limitation all three sampling times.

III. LAKE AND DRAINAGE BASIN CHARACTERISTICS†

A. Morphometry††:

1. Surface area: 10.52 kilometers^2.
2. Mean depth: Unknown
3. Maximum depth: 3.7 meters.
4. Volume: Unknown

B. Precipitation*:

1. Year of sampling: 27.6 centimeters.
2. Mean annual: 27.7 centimeters.

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† Table of metric equivalents--Appendix B
†† Dendy, 1974
* See Working Paper No. 175, "...Survey Methods, 1973-1976."

IV. LAKE WATER QUALITY SUMMARY

Lake Elsinore was sampled three times in 1975 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from one or more depths at six stations on the lake (see map, page v). During each visit, a single depth-integrated (near bottom to surface) sample was composited from the stations for phytoplankton identification and enumeration; and during the first and last visits, 18.9-liter depth-integrated samples were composited for algal assays. Also each time, a depth-integrated sample was collected from each of the stations for chlorophyll a analysis. The maximum depths sampled were 2.7 meters at station 1; 1.5 meters at station 2; 1.5 meters at stations 3; and near-surface only at stations 4, 5, and 6.

The sampling results are presented in full in Appendix C and are summarized in the following table.

A. SUMMARY OF PHYSICAL AND CHEMICAL CHARACTERISTICS FOR LAKE ELSINORE
STORET CODE 0607

PARAMETER	1ST SAMPLING (3/10/75) 6 SITES RANGE	MEAN	MEDIAN	2ND SAMPLING (6/23/75) 6 SITES RANGE	MEAN	MEDIAN	3RD SAMPLING (11/13/75) 6 SITES RANGE	MEAN	MEDIAN
TEMP (C)	10.0 - 11.1	10.7	10.8	20.5 - 27.4	23.5	23.1	15.5 - 28.0	18.8	17.1
DISS OXY (MG/L)	7.4 - 9.6	8.3	8.0	7.2 - 11.0	9.2	9.6	7.0 - 14.6	9.9	9.8
CNDCTVY (MCROMO)	5249. - 5677.	5504.	5537.	1026. - 6012.	4960.	5490.	5641. - 6407.	5790.	5673.
PH (STAND UNITS)	9.0 - 9.1	9.0	9.0	8.5 - 9.3	9.0	9.1	9.2 - 9.4	9.3	9.3
TOT ALK (MG/L)	675. - 960.	826.	793.	660. - 1020.	896.	948.	122. - 1780.	1147.	1300.
TOT P (MG/L)	0.470 - 0.650	0.515	0.487	0.409 - 0.588	0.469	0.438	0.050 - 0.498	0.366	0.426
ORTHO P (MG/L)	0.244 - 0.270	0.254	0.253	0.070 - 0.095	0.086	0.091	0.030 - 0.119	0.046	0.034
NO2+NO3 (MG/L)	0.030 - 0.040	0.033	0.030	0.040 - 0.060	0.044	0.040	0.080 - 0.310	0.192	0.220
AMMONIA (MG/L)	0.040 - 0.060	0.046	0.045	0.070 - 0.090	0.079	0.080	0.040 - 0.080	0.049	0.040
KJEL N (MG/L)	2.600 - 4.000	3.010	2.950	2.600 - 3.200	2.914	2.900	0.500 - 4.900	3.644	4.400
INORG N (MG/L)	0.070 - 0.100	0.079	0.075	0.110 - 0.140	0.123	0.120	0.120 - 0.350	0.241	0.280
TOTAL N (MG/L)	2.630 - 4.030	3.043	2.980	2.640 - 3.260	2.959	2.940	0.580 - 5.000	3.837	4.620
CHLRPYL A (UG/L)	33.8 - 69.3	52.1	48.6	1.6 - 60.1	41.9	47.8	0.6 - 172.8	117.7	151.4
SECCHI (METERS)	0.3 - 0.5	0.3	0.3	0.1 - 0.3	0.2	0.3	0.3 - 0.3	0.3	0.3

B. Biological characteristics:

1. Phytoplankton -

Sampling Date	Dominant Genera	Algal Units per ml
03/10/75	1. Chlamydomonas sp.	99,798
	2. Ankistrodesmus sp.	34,004
	3. Cyclotella sp.	2,213
	4. Cryptomonas sp.	2,213
	5. Chlorogonium sp.	805
	Other genera	402
	Total	139,435
06/23/75	1. Chlamydomonas sp.	10,045
	2. Anabaenopsis sp.	5,281
	3. Ankistrodesmus sp.	2,485
	4. Cyclotella sp.	414
	5. Oscillatoria sp.	362
	Other genera	674
	Total	19,261
11/13/75	1. Chlorophytan lunate cells	79,650
	2. Chlorococcalean cells	25,519
	3. Ankistrodesmus sp.	12,663
	4. Nitzschia sp.	11,406
	5. Pennate diatoms	7,733
	Other genera	4,544
	Total	141,515

2. Chlorophyll *a* -

Sampling Date	Station Number	Chlorophyll *a* (µg/l)
03/10/75	1	69.3
	2	33.8
	3	43.9
	4	51.6
	5	45.7
	6	68.5
06/23/75	1	51.4
	2	45.5
	3	50.1
	4	60.1
	5	1.6*
	6	42.6
11/13/75	1	172.8
	2	144.0
	3	168.0
	4	158.8
	5	0.6*
	6	62.0

C. Limiting Nutrient Study:

1. Autoclaved, filtered, and nutrient spiked -

a. March sample (stations 1, 2, and 3)

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.185	0.128	6.3
0.050 P	0.235	0.128	6.2
0.050 P + 1.0 N	0.235	1.128	36.9
1.0 N	0.185	1.128	33.6

b. November sample (stations 1, 2, and 3)

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.085	0.328	11.1
0.050 P	0.135	0.328	12.7
0.050 P + 1.0 N	0.135	1.328	26.0
1.0 N	0.085	1.328	17.9

* Sample collected while well pump was operating (see page 1).

c. November sample (stations 4, 5, and 6)

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.125	0.255	16.5
0.050 P	0.175	0.255	14.8
0.050 P + 1.0 N	0.175	1.255	47.2
1.0 N	0.125	1.255	43.2

2. Discussion -

The control yields of the assay alga, Selenastrum capricornutum, indicate that the potential primary productivity of Lake Elsinore was very high at the times the algal assay samples were collected (03/10/75 and 11/13/75).

Also, the significant increases in yields when nitrogen was added alone, and the lack of response when only phosphorus was added, indicate nitrogen limitation at those times.

The lake data indicate nitrogen limitation all three sampling times. The mean inorganic nitrogen to orthophosphorus ratios were less than 1 to 1 in March, 1 to 1 in June, and 5 to 1 in November.

V. LITERATURE REVIEWED

Allum, M.O., R.E. Glessner, and J.H. Gakstatter, 1977. An evaluation of the National Eutrophication Survey data. Working Paper No. 900, Corvallis Env. Res. Lab., Corvallis, OR.

Anonymous, 1975. Water quality control plan report. CA Water Res. Contr. Bd., Sacramento.

Bailey, Thomas E., 1977. Personal communication (reviews of preliminary report). CA Water Res. Contr. Bd., Sacramento.

Dendy, William B., 1974. Personal communication (water body information and morphometry). CA Water Res. Contr. Bd., Sacramento.

VI. APPENDICES

APPENDIX A

LAKE RANKINGS

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLOPA	15-MIN DO	MEDIAN DISS ORTHO P
0601	AMADOR RESERVOIR	0.040	0.390	408.667	22.383	14.600	0.020
0602	BOCA LAKE	0.012	0.040	372.833	1.700	6.800	0.003
0603	LAKE HPITTON	0.067	0.115	446.500	4.811	11.200	0.047
0604	CASITAS RESERVOIR	0.029	0.050	400.250	3.192	14.000	0.014
0605	CROWLEY LAKE	0.046	0.045	374.750	5.800	12.200	0.034
0606	DON PEDRO RESERVOIR	0.013	0.060	381.733	3.564	11.400	0.004
0607	LAKE ELSINORE	0.469	0.120	489.214	70.572	5.000	0.092
0608	FALLEN LEAF RESERVOIR	0.007	0.040	24.357	0.786	8.800	0.005
0609	LAKE HENNESSEY	0.027	0.060	416.000	4.525	15.000	0.012
0610	LAKE HENSHAW	0.138	0.070	461.000	26.783	9.800	0.073
0611	IRON GATE RESERVOIR	0.184	0.690	440.333	6.217	13.800	0.124
0614	LOPEZ LAKE	0.371	0.090	372.000	8.658	15.000	0.343
0615	LAKE MARY	0.010	0.040	296.000	2.550	10.600	0.002
0616	LAKE MENDOCINO	0.020	0.050	436.500	3.100	9.400	0.008
0617	NICASIO RESERVOIR	0.055	0.345	482.778	6.633	9.800	0.013
0618	LOWER OTAY RESERVOIR	0.058	0.180	447.250	15.933	15.000	0.013
0619	LAKE PILLSBURY	0.022	0.060	466.667	4.389	8.200	0.008
0620	SANTA MARGARITA LAKE	0.037	0.070	480.000	9.122	14.800	0.014
0621	SHASTA LAKE	0.021	0.060	381.542	4.887	9.000	0.015
0622	SHAVER	0.014	0.060	346.400	1.700	7.400	0.004
0623	SILVER LAKE	0.012	0.055	356.000	1.800	7.000	0.003
0624	TULLOCK RESERVOIR	0.025	0.060	433.000	13.878	7.400	0.009
0625	UPPER TWIN LAKES	0.015	0.040	300.200	3.340	7.400	0.004
0626	LOWER TWIN LAKES	0.014	0.040	248.000	2.900	11.400	0.003

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	SDD-MEAN SEC	MEAN CHLORA	1S-MIN DO	MEDIAN DISS ORTHO P	INDEX NU
0601	AMADOR RESERVOIR	35 (8)	4 (1)	43 (10)	9 (2)	17 (4)	26 (6)	134
0602	BOCA LAKE	89 (20)	98 (22)	70 (16)	91 (21)	100 (23)	91 (20)	539
0603	LAKE BPITTON	17 (4)	22 (5)	17 (4)	48 (11)	43 (10)	17 (4)	164
0604	CASITAS RESERVOIR	43 (10)	74 (17)	48 (11)	70 (16)	22 (5)	37 (8)	294
0605	CROWLEY LAKE	30 (7)	78 (18)	65 (15)	43 (10)	30 (7)	22 (5)	268
0606	DON PEDRO RESERVOIR	83 (19)	54 (11)	57 (13)	61 (14)	37 (8)	78 (17)	370
0607	LAKE ELSINORE	0 (0)	17 (4)	0 (0)	0 (0)	78 (18)	9 (2)	104
0608	FALLEN LEAF RESERVOIR	100 (23)	87 (19)	100 (23)	100 (23)	70 (16)	70 (16)	527
0609	LAKE HENNESSEY	48 (11)	54 (11)	39 (9)	52 (12)	4 (0)	52 (12)	249
0610	LAKE HENSHAW	13 (3)	33 (7)	13 (3)	4 (1)	54 (12)	13 (3)	130
0611	IRON GATE RESERVOIR	9 (2)	0 (0)	26 (6)	39 (9)	26 (6)	4 (1)	104
0614	LOPEZ LAKE	4 (1)	26 (6)	74 (17)	26 (6)	4 (0)	0 (0)	134
0615	LAKE MARY	96 (22)	87 (19)	91 (21)	83 (19)	48 (11)	100 (23)	505
0616	LAKE MENDOCINO	65 (15)	70 (16)	30 (7)	74 (17)	61 (14)	63 (14)	363
0617	NICASIO RESERVOIR	26 (6)	9 (2)	4 (1)	30 (7)	54 (12)	46 (10)	169
0618	LOWER OTAY RESERVOIR	22 (5)	13 (3)	22 (5)	13 (3)	4 (0)	46 (10)	120
0619	LAKE PILLSBURY	57 (13)	41 (9)	9 (2)	35 (8)	74 (17)	63 (14)	279
0620	SANTA MARGARITA LAKE	39 (9)	33 (7)	52 (12)	22 (5)	13 (3)	37 (8)	196
0621	SHASTA LAKE	61 (14)	54 (11)	61 (14)	57 (13)	65 (15)	30 (7)	328
0622	SHAVER	78 (18)	41 (9)	83 (19)	96 (22)	87 (19)	78 (17)	463
0623	SILVER LAKE	89 (20)	65 (15)	78 (18)	87 (20)	96 (22)	91 (20)	506
0624	TULLOCK RESERVOIR	52 (12)	54 (11)	35 (8)	17 (4)	87 (19)	57 (13)	302
0625	UPPER TWIN LAKES	70 (16)	98 (22)	87 (20)	65 (15)	87 (19)	78 (17)	485
0626	LOWER TWIN LAKES	74 (17)	87 (19)	96 (22)	78 (18)	37 (8)	91 (20)	463

LAKES RANKED BY INDEX NOS.

RANK	LAKE CODE	LAKE NAME	INDEX NO
1	0602	BOCA LAKE	539
2	0608	FALLEN LEAF RESERVOIR	527
3	0623	SILVER LAKE	506
4	0615	LAKE MARY	505
5	0625	UPPER TWIN LAKES	485
6	0626	LOWER TWIN LAKES	463
7	0622	SHAVER	463
8	0606	DON PEDRO RESERVOIR	378
9	0616	LAKE MENDOCINO	363
10	0621	SHASTA LAKE	328
11	0624	TULLOCK RESERVOIR	302
12	0604	CASITAS RESERVOIR	294
13	0619	LAKE PILLSBURY	279
14	0605	CROWLEY LAKE	268
15	0609	LAKE HENNESSEY	249
16	0620	SANTA MARGARITA LAKE	196
17	0617	MICASIO RESERVOIR	169
18	0603	LAKE BRITTON	164
19	0614	LOPEZ LAKE	134
20	0601	AMADOR RESERVOIR	134
21	0610	LAKE HENSHAW	130
22	0618	LOWER OTAY RESERVOIR	120
23	0607	LAKE ELSINORE	104
24	0611	IRON GATE RESERVOIR	104

APPENDIX B

CONVERSION FACTORS

CONVERSION FACTORS

Hectares x 2.471 = acres

Kilometers x 0.6214 = miles

Meters x 3.281 = feet

Cubic meters x 8.107×10^{-4} = acre/feet

Square kilometers x 0.3861 = square miles

Cubic meters/sec x 35.315 - cubic feet/sec

Centimeters x 0.3937 = inches

Kilograms x 2.205 = pounds

Kilograms/square kilometer x 5.711 = lbs/square mile

APPENDIX C

PHYSICAL and CHEMICAL DATA

STORET RETRIEVAL DATE 76/09/24

960791
33 40 00.0 117 21 30.0 3
LAKE ELSINORE
06065 CALIFORNIA

140792

11EPALES 2111202
0011 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/03/10	09 25	0000	10.7	8.0	10	5677	9.00	750	0.050	3.100	0.040	0.255
	09 25	0005	10.9	7.8		5534	9.00	755	0.040	2.900	0.030	0.259
	09 25	0009	10.9	7.6		5560	9.00	795	0.040	2.800	0.030	0.262
75/06/23	14 40	0000	23.7	11.6	11	5890	9.10	805	0.040	3.200	0.060	0.070
	14 40	0006	20.5	7.2		5480	9.00	955	0.070	2.900	0.040	0.095
75/11/13	15 00	0000	17.3	11.4	11	5793	9.40	1300	0.040	4.000	0.220	0.033
	15 00	0005	15.5	7.6		5641	9.35	1490	0.040	4.400	0.249	0.031

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/03/10	09 25	0000	0.483	60.3	
	09 25	0005	0.473		
	09 25	0009	0.492		
75/06/23	14 40	0000	0.409	51.4	
	14 40	0006	0.464		
75/11/13	15 00	0000	0.420	172.8	
	15 00	0005	0.426		

STORET RETRIEVAL DATE 75/09/24

060702
33 34 25.0 117 21 24.0 3
LAKE ELSINORE
06065 CALIFORNIA

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11EPALES 2111202
0008 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/03/10	09 55	0000	10.9	7.4	12	5545	9.00	790	0.040	3.000	0.030	0.260
	09 55	0005	11.1	9.6		5540	9.00	960	0.040	2.800	0.030	0.270
75/06/23	15 05	0000	22.5	9.6	10	5703	9.05	940	0.070	2.900	0.040	0.082
	15 05	0005	21.5	7.8		5500	9.00	995	0.080	2.900	0.040	0.092
75/11/13	15 30	0000	16.0	9.8	11	5673	9.35	1640	0.040	4.400	0.260	0.030
	15 30	0004	15.7	7.6		5693	9.35	1340	0.040	4.600	0.310	0.037

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/03/10	09 55	0000	0.608	33.8	
	09 55	0005	0.650		
75/06/23	15 05	0000	0.438	45.5	
	15 05	0005	0.505		
75/11/13	15 30	0000	0.404	144.0	
	15 30	0004	0.498		

STORET RETRIEVAL DATE 76/09/24

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LAKE ELSINORE
06065 CALIFORNIA
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11EPALES 2111202
0009 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/03/10	10 15	0000	10.8	8.0	12	5450	9.00	955	0.050	2.600	0.030	0.244
	10 15	0005	11.0	8.0		5522	9.00	900	0.050	3.100	0.030	0.246
75/06/23	15 20	0000	25.3	10.6	11	6012	9.10	1020	0.080	3.100	0.050	0.091
75/11/13	15 45	0000	17.1	13.0	11	5671	9.30	1260	0.060	4.400	0.220	0.034
	15 45	0005	15.5	7.0		5653	9.30	1260	0.060	4.400	0.220	0.034

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/03/10	10 15	0000	0.506	43.9	
	10 15	0005	0.508		
75/06/23	15 20	0000	0.436	50.1	
75/11/13	15 45	0000	0.444	168.0	
	15 45	0005	0.444		

STORET RETRIEVAL DATE 76/09/24

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LAKE ELSINORE
06065 CALIFORNIA

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11EPALES 2111202
0003 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/03/10	10 40	0000	10.0	8.8	14	5419	9.05	750	0.050	3.000	0.040	0.248
75/06/23	15 45	0000	27.4		3K	4705	9.20		0.080	2.800	0.040	0.092
75/11/12	15 55	0000	20.0	14.6	10	6407	9.30	1780	0.040	4.900	0.100	0.045

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/03/10	10 40	0000	0.481	51.6	
75/06/23	15 45	0000	0.588	60.1	
75/11/12	15 55	0000	0.445	158.8	

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LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/24

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LAKE ELSINORE
06065 CALIFORNIA
140792

11EPALES 2111202
0001 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/03/10	10 55	0000	10.0	8.8	12	5545	9.00	675	0.040	4.000	0.030	0.251
75/06/23	15 50	0000				1026	8.50					
75/11/13	16 30	0000	24.5	10.4			9.20	122	0.040	0.500	0.080	0.049

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/03/10	10 55	0000	0.481	45.7	
75/06/23	15 50	0000		1.6	
75/11/13	16 30	0000	0.050	0.6	

STORET RETRIEVAL DATE 76/09/24

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LAKE ELSINORE
06065 CALIFORNIA

140792

11EPALES 2111202
0002 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/03/10	11 05	0000	10.6	8.6		5249	9.10	925	0.060	2.800	0.040	0.248
75/06/23	16 05	0000			5	5360	9.25	660	0.090	2.600	0.040	0.080
75/11/13	16 15	0000	28.0	7.6			9.30	144	0.080	1.200	0.080	0.119

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	09031 INCDT LT REMNING PERCENT
75/03/10	11 05	0000	0.470	68.5	
75/06/23	16 05	0000	0.437	42.6	
75/11/13	16 15	0000	0.166	62.0	